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San Juan Basin Action Plan

WILDERNESS VALUES TECHNICAL REPORT

for the
Environmental Impact Statement on Public Service Company of New Mexico's Proposed New Mexico Generating Station and Possible New Town

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1982
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United States
Department
of the Interior

Bureau of Land Management
New Mexico State Office
Santa Fe, New Mexico

October 1982

Report 19 of 22

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
P.O. BOX 1449
SANTA FE, NEW MEXICO 87501

IN REPLY REFER TO
NM30840EIS
1792.73(934A)

October 1982

Dear Interested Citizen:

Attached is one of twenty-two technical reports developed as a basis for writing the Environmental Impact Statement on Public Service Company of New Mexico's Proposed New Mexico Generating Station and Possible New Town (NMGS EIS). (A list of the technical reports is attached.)

These technical reports provide detailed information on the existing environment, methods used for the impact analysis, and related data supportive of the analysis and conclusions presented in the EIS. These reports should be retained for use with the Draft and Final EIS and other documents related to BLM's San Juan Basin Action Plan (SJBAP).

The Draft NMGS EIS will be filed with the Environmental Protection Agency and released for public review on November 30, 1982. Comments on the Draft EIS will be due by close of business February 7, 1983, at the BLM New Mexico State Office. Because of the large volume of material presented in the technical reports, the BLM is distributing these reports in advance of the Draft EIS to provide sufficient time for public review. The technical reports will be available for public review at the places indicated on the attached list. Copies will also be available from the BLM New Mexico State Office, U.S. Post Office and Federal Building, Santa Fe, for a copy fee.

Informational public meetings are scheduled for December 1982 to provide a public forum to clarify questions and concerns about the SJBAP proposals and the related environmental documents, which will all have been issued by that time. The meetings are scheduled as follows:

- December 14, Civic Center, Farmington, 3 to 9 PM
- December 14, Convention Center, Albuquerque, 3 to 9 PM
- December 15, Chapter House, Crownpoint, 3 to 9 PM
- December 16, Holiday Inn, Gallup, 3 to 9 PM
- December 16, Kachina Lodge, Taos, 3 to 9 PM

In addition, formal public hearings will be held in January 1983 to solicit public comments on the SJBAP Proposals. These meetings are scheduled as follows:

- January 10, Chapter House, Crownpoint, beginning at 1:00 PM
- January 12, Civic Center, Farmington, beginning at 9:00 AM
- January 14 (and 15th if necessary because of the number of registrants), Four Seasons Motor Lodge, Albuquerque, I-40 and Carlisle Blvd., beginning at 9:00 AM (each day)

Questions on the public meetings, hearings, and the technical reports themselves should be directed to:

Leslie M. Cone
NMGS Project Manager
BLM, New Mexico State Office
P.O. Box 1449
Santa Fe, NM 87501
(505) 988-6184 FTS 476-6184

Sincerely yours,

Charles W. Luscher

Charles W. Luscher
State Director, New Mexico

List of Technical Reports

1. Purpose and Need
2. Project Description
3. Alternatives to the Project
4. Site Alternatives
5. Permit Reconnaissance
6. Air Quality
7. Geologic Setting
8. Mineral Resources
9. Paleontology
10. Soils, Prime and Unique Farmlands
11. Hydrology
12. Water Quality
13. Vegetation
14. Wildlife and Aquatic Biology
15. Threatened and Endangered Species
16. Cultural Resources
17. Visual Resources
18. Recreation Resources
19. Wilderness Values
20. Transportation
21. Social and Economic Conditions
22. Land Use Controls and Constraints

Availability of Technical Reports for Public Review

Individual copies of the technical reports can be obtained for a copy fee. Inquiries should be directed to:

Bureau of Land Management, New Mexico State Office
Title Records and Public Assistance Section (943B)
U.S. Post Office and Federal Building
P.O. Box 1449
Santa Fe, NM 87501
(505) 988-6107 FTS 476-6107

Copies of the reports are available for public review at the locations listed below. [Formal and informal cooperating agencies are denoted by an asterisk (*).]

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New Mexico State Office

NMGS Project Staff (934A)
Room 122, Federal Building
Cathedral Place
P.O. Box 1449
Santa Fe, NM 87501
(505) 988-6184 FTS 476-6184

San Juan Energy Projects Staff (911)
Room 129, Federal Building
Cathedral Place
P.O. Box 1449
Santa Fe, NM 87501
(505) 988-6226 FTS 476-6226

Public Affairs Staff (912)
Room 2016
U.S. Post Office and Federal Building
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Santa Fe, NM 87501
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Division of Resources(930)
509 Camino de los Marquez, Suite 3
P.O. Box 1449
Santa Fe, NM 87501
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P.O. Box 568
Farmington, NM 87401
(505) 325-3581

Taos Resource Area Office
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Taos, NM 87571
(505) 758-8851

Socorro District Office
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P.O. Box 506
Carlsbad, NM 88220
(505) 887-6544

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Santa Fe, NM 87503
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Santa Fe, NM 87503
(505) 827-3326

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State Historic Preservation Officer
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New Mexico Public Service Commission*
Bataan Memorial Building
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(505) 827-3361

New Mexico State Engineer's Office*
Bataan Memorial Building
Santa Fe, NM 87503
(505) 827-2423

New Mexico State Planning Office*
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Santa Fe, NM 87503
(505) 827-5191

OTHER ORGANIZATIONS

Public Service Company of New Mexico
Alvarado Square
P.O. Box 2268
Albuquerque, NM 87158
(505) 848-2700

Woodward-Clyde Consultants, Inc.
3 Embarcadero Center, Suite 700
San Francisco, California 94111
(415) 956-7070

PUBLIC AND UNIVERSITY LIBRARIES

Reading copies of the NMGS EIS and associated technical reports will be available at the following public and university libraries:

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Albuquerque, NM 87102

Aztec Public Library
201 W. Chaco
Aztec, NM 87401

Crownpoint Community Library
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Crownpoint, NM 87313

Cuba Public Library
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Cuba, NM 87027

Farmington Public Library
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Farmington, NM 87401

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Gallup, NM 87301

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Bureau of Indian Affairs*
Eastern Navajo Agency
P.O. Box 328
Crownpoint, NM 87313
(505) 786-5228

Bureau of Indian Affairs*
Navajo Area Office
Box M - Mail Code 305
Window Rock, AZ 86515
(602) 871-5151 FTS 479-5314

Bureau of Reclamation*
Upper Colorado Regional Office
125 S. State Street
P.O. Box 11568
Salt Lake City, UT 84147
(801) 524-5463 FTS 588-5463

Minerals Management Service*
South Central Region
505 Marquette Avenue NW, Suite 815
Albuquerque, NM 87102
(505) 766-1173 FTS 474-1173

Minerals Management Service*
Resource Evaluation Office
411 N. Auburn
Farmington, NM 87401
(505) 327-7397 FTS 572-6254

National Park Service*
Southwest Regional Office
1100 Old Santa Fe Trail
Santa Fe, NM 87501
(505) 988-6375 FTS 476-6375

National Park Service*
Environmental Coordination Office
Pinon Building, 1220 St. Francis Drive
P.O. Box 728
Santa Fe, NM 87501
(505) 988-6681 FTS 476-6681

U.S. Fish and Wildlife Service*
Field Supervisor, Ecological Services
3530 Pan American Highway, Suite C
Albuquerque, NM 87107
(505) 766-3966 FTS 479-3966

U.S. Geological Survey (WRD)*
505 Marquette Avenue, Room 720
Albuquerque, NM 87101
(505) 766-2810 FTS 474-2817

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Region VI
1201 Elm Street
Dallas, TX 75270
(214) 767-2716 FTS 729-2716

Navajo Tribe*
c/o Division of Resources
P.O. Box 308
Window Rock, AZ 86515
(602) 871-6592

Pueblo of Zia*
General Delivery
San Ysidro, NM 87053
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Albuquerque, NM 87102
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District Ranger
Mt. Taylor Ranger District
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Espanola, NM 87532

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Farmington, NM 87401

University of New Mexico, Gallup Campus
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Gallup, NM 87301

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WILDERNESS VALUES
TECHNICAL REPORT

for the
Environmental Impact Statement
on Public Service Company of New Mexico's
Proposed New Mexico Generating Station
and Possible New Town

Prepared by

Woodward-Clyde Consultants

for the

U.S. Department of the Interior
Bureau of Land Management

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NEW MEXICO GENERATING STATION

1.0
INTRODUCTION

BACKGROUND

Included in the recent Council on Environmental Quality Regulations (1979) are several important objectives to reduce excessive paperwork in the preparation of environmental impact statements (EISs):

- Discuss only briefly issues other than significant ones.
- Emphasize the portions of the EIS that are useful to decision makers and the public and reduce emphasis on background material.
- Prepare analytic rather than encyclopedic EISs.

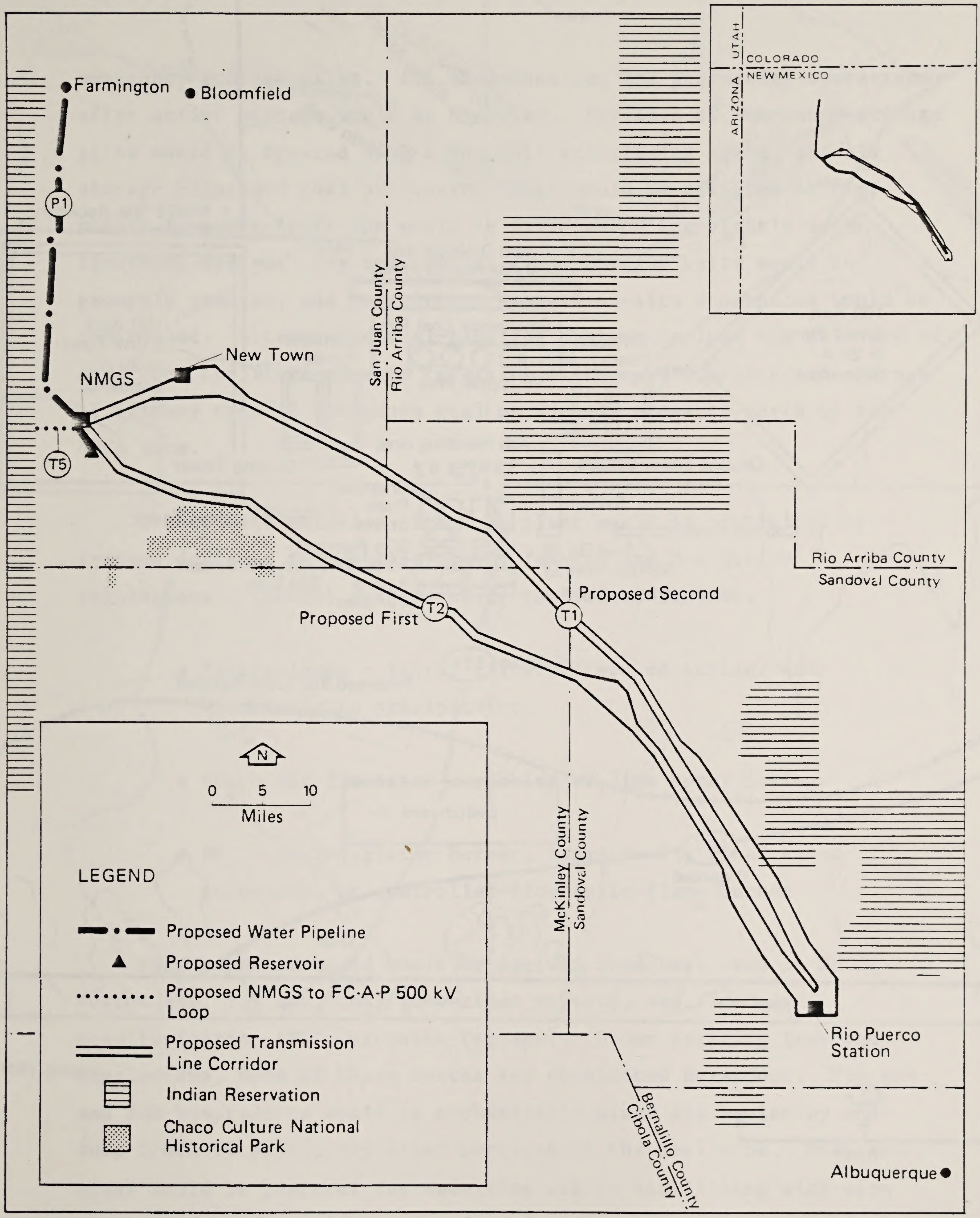
In order to accomplish these objectives and still provide the depth and background required for an analytic impact statement, this technical report has been prepared for the New Mexico Generating Station (NMGS) project. In this report, impacts that were not identified as significant but which are still considered important by the public or technical specialists are analyzed. Background material is provided for those issues and impacts that were considered necessary for the comparison of alternatives. Impacts that were not identified as significant or important by the public and by technical preparers are summarized, and reasons for their elimination from detailed analysis are discussed.

SUMMARY DESCRIPTION OF PROJECT COMPONENTS

Public Service Company of New Mexico (PNM) proposes to construct a 2000-megawatt (MW) coal-fired electric generation plant approximately 35 miles south of Farmington, New Mexico, in San Juan County (Map 1-1). The proposed NMGS, at ultimate development, would have four 500-MW generating units. Each generating unit would include a turbine generator area, coal pulverizer area, boiler area, particulate removal system, SO_2 removal system, and chimney stack. The proposed arrangement of these and other power plant components is shown in Figure 1-1. For the environmental analysis, it was assumed that commercial operation of the first 500-MW unit would begin in 1990 and that other units would start operating during the 1990s.

Coal for NMGS would be acquired through long-term contracts with Sunbelt Mining and Arch Minerals (Proposed Action) or other producers in the San Juan Basin (alternative coal supply). Coal acquired from a joint venture of Sunbelt and Arch Minerals would be supplied from surface mines (referred to as the Bisti mine in this analysis) in the immediate vicinity of the proposed plant site. Coal acquired from other producers in the San Juan Basin would be hauled from mines located as much as 30 miles from the proposed plant site. Coal required for NMGS would average 7.5 million tons per year, or a total of 300 million tons over the 40-year project life.

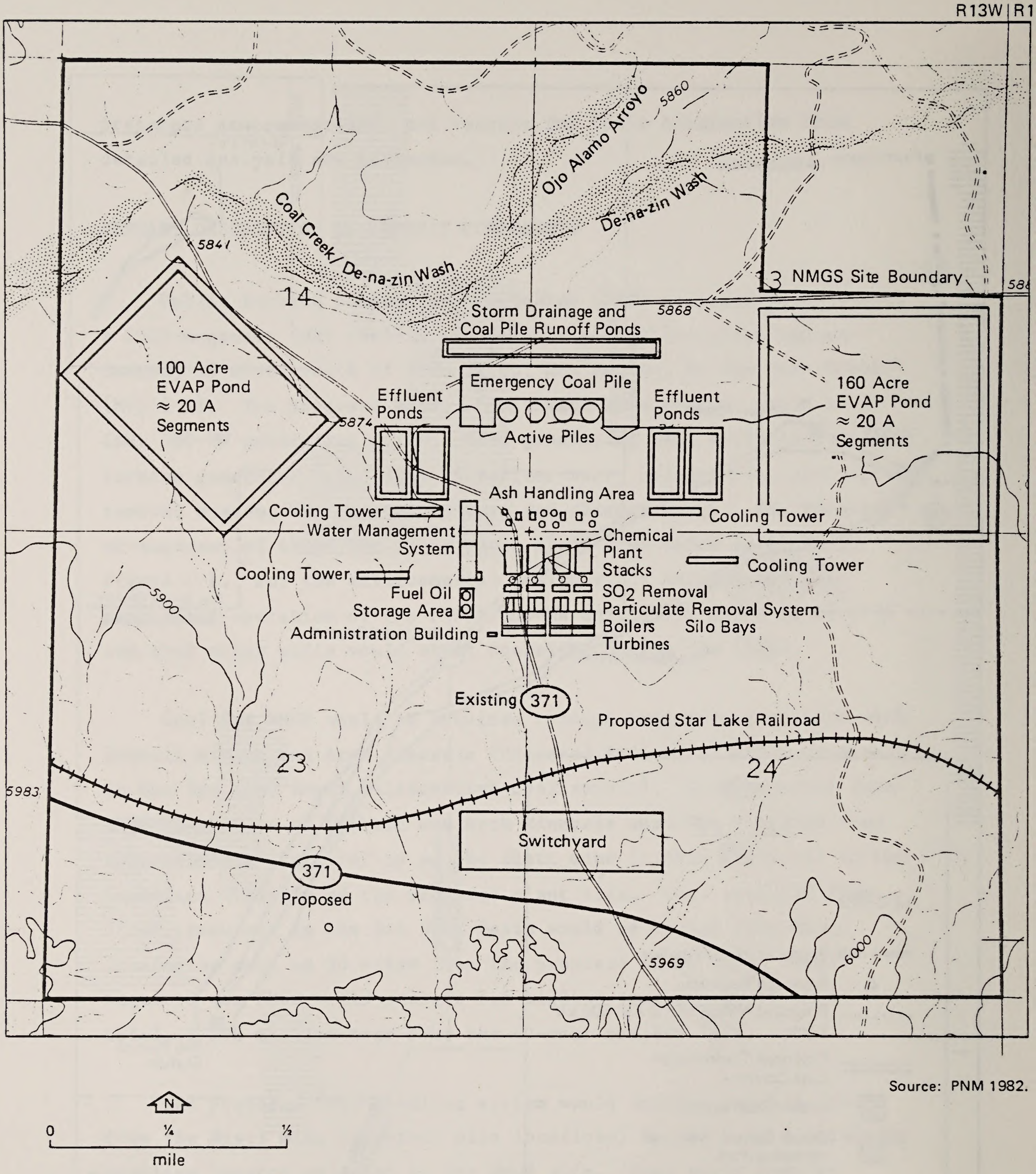
The proposed fuel-handling system would involve hauling coal from the Bisti mine (or other mine locations) by truck to a receiving facility located adjacent to the NMGS site. Coal would then be transferred via conveyor belt from the receiving station to active or



Note: For more information, see the location maps in Appendix G of the EIS.

Source: BLM 1982.

Map 1-1. GENERAL LOCATION OF PROPOSED ACTION



Source: PNM 1982.

Figure 1-1. STATION LAYOUT

emergency storage piles. All coal-handling and processing operations after active storage would be enclosed. Surfaces of emergency storage piles would be treated with a nontoxic stabilizing agent, and all storage piles and coal-processing areas would be designed so that runoff from precipitation would be diverted to the plant's water treatment system. Any coal spills from conveyor belts would be promptly removed, and percolation beneath on-site stockpiles would be controlled. Alternative fuel-handling systems include the delivery of coal from the Bisti mine to receiving station by conveyor and storage of primary crushed emergency coal on Sunbelt property north of the NMGS site.

Atmospheric emissions from the plant would be controlled by systems designed to meet applicable federal and New Mexico regulations. Control systems being considered include:

- Particulates - fabric filter (Proposed Action) and electrostatic precipitator
- SO_2 - wet limestone scrubbing or lime spray drying
- NO_x - dual-register burner, tangentially fired steam generator, or controlled-flow/split-flame burner

Four types of waste would be derived from coal used in NMGS: bottom ash, fly ash, coal pulverizer rejects, and flue gas desulfurization (FGD) products (sludge). Under existing laws and regulations, none of these wastes are considered hazardous. Fly ash and FGD by-products would be mechanically mixed and hauled by end-dump truck to previously mined portions of the coal mine. Disposal areas would be prepared for receiving ash by backfilling with mine overburden. Ash would then be dumped and spread in layers over the mine overburden. After the ash was placed and spread, it would be covered with layers of overburden and surface soil or topsoil and then a vegetative cover would be established. Bottom ash and pulverizer rejects would be collected for disposal in dewatering bins and then hauled by end-dump trucks for disposal into previously mined portions of the coal mine. Procedures for disposal would be the same as for fly ash.

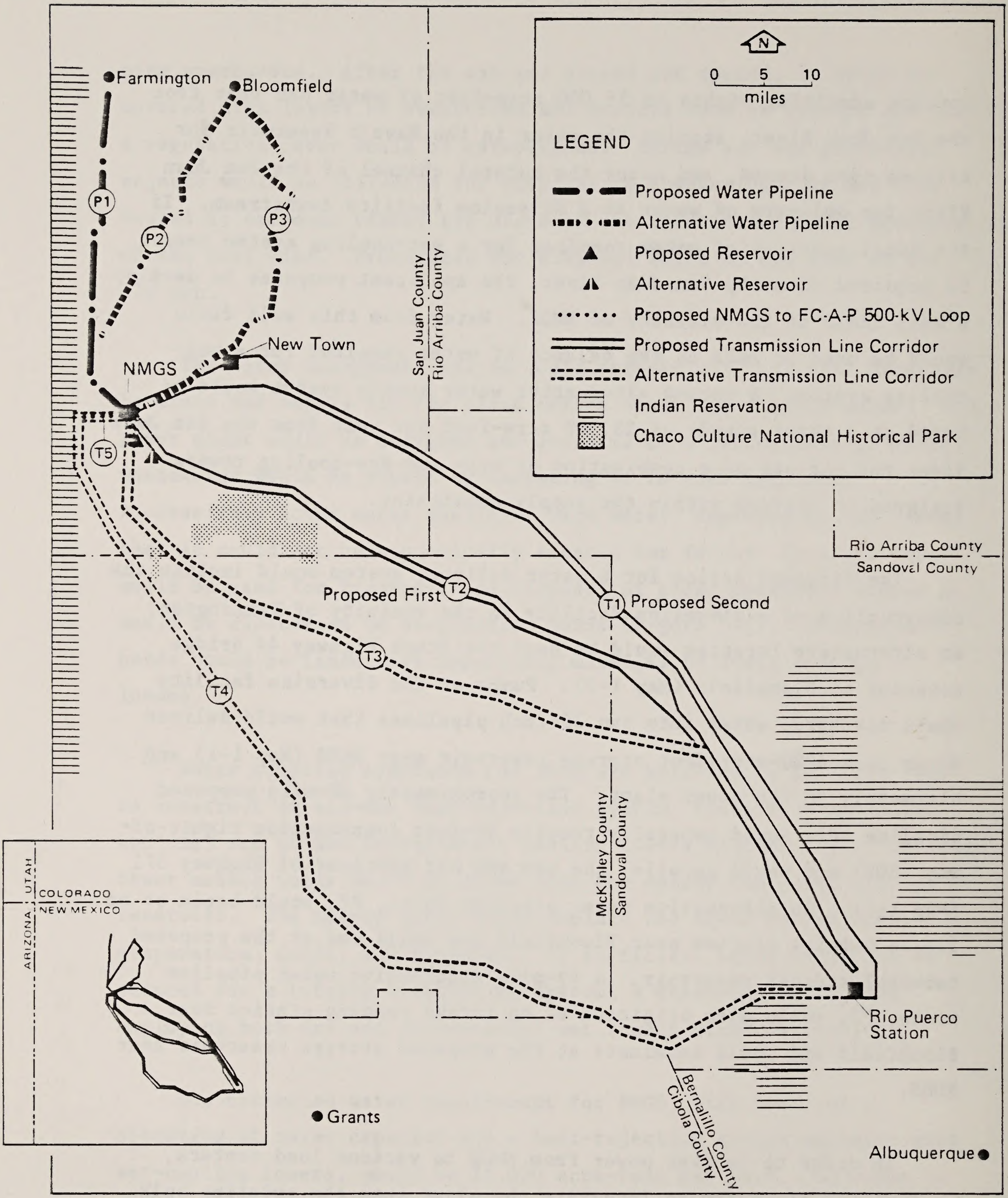
The water management system would contain all equipment necessary to treat and supply all the plant makeup water and potable water. The power plant would be designed and operated as a zero-discharge plant; wastewater would be reused by cascading it to uses requiring successively lower water quality. Used water, degraded to the extent that it could not be economically treated for further in-plant use, would be used for transport and disposal of plant-generated wastes or would be discharged to evaporation ponds (Figure 1-1). Evaporation ponds would be lined with impervious material to limit seepage losses.

Water supplies available for NMGS are believed to be sufficient to construct an all-wet heat-rejection system, based on evaporative cooling, and to use forced-draft cooling towers (Figure 1-1). Cooling-tower makeup water would be drawn from the nearby raw-water storage reservoir. The makeup water would replace the tower losses from evaporation, drift, and blowdown. If sufficient water could not be secured for a totally evaporative system, a water-cooling system employing both dry and conventional wet towers might be required.

The estimated water requirement for NMGS, with four units operating at rated capacity and a heat-rejection system equipped with wet-cooling towers, would be 35,000 acre-feet per year. In order to supply this quantity of water to NMGS, the Proposed Action would involve acquiring rights to 35,000 acre-feet of water per year from the San Juan River, storing the water in the Navajo Reservoir for release upon demand, and using the natural channel of the San Juan River for delivery of water to a diversion facility downstream. If the total quantity of water required for a wet-cooling system cannot be acquired from the San Juan River, the applicant proposes to develop a well field in the vicinity of NMGS. Water from this well field would be used to make up the balance of water required for a wet-cooling system. A second alternative water supply system would be based on a total supply of 20,000 acre-feet per year from the San Juan River and the use of a combination of wet- and dry-cooling towers designed to perform within the supply constraint.

The Proposed Action for a water delivery system would include the construction of a diversion facility in the vicinity of Farmington; an alternative location would be near the State Highway 44 bridge crossing at Bloomfield (Map 1-2). Pumps at the diversion facility would discharge water into two 36-inch pipelines that would deliver water to a 4000-acre-foot storage reservoir near NMGS (Map 1-1) and ultimately to the power plant. The approximately 40-mile proposed pipeline (P1) would generally require 90-foot construction rights-of-way (ROW) and would parallel the new and old portions of Highway 371 (Map 1-1). An alternative water pipeline route, P2, would begin at an intake pumping station near Bloomfield and would end at the proposed terminal storage reservoir. A 49-mile alternative water pipeline route, P3, would also originate at an intake pumping station near Bloomfield and would terminate at the proposed storage reservoir near NMGS.

In order to deliver power from NMGS to various load centers, it would be necessary to integrate the plant into the existing bulk



Note: For more information, see the location maps in Appendix G of the EIS.

Source: BLM 1982.

Map 1-2. GENERAL LOCATION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION transmission systems of PNM and neighboring utilities. Thus the proposed transmission system would consist of a 500-kilovolt (kV) loop linking NMGS with PNM's approved 500-kV Four Corners-Ambrosia-Pajarito (FC-A-P) line, located approximately 5 miles west of NMGS, and two 500-kV lines linking NMGS with the Albuquerque distribution and load center at the proposed Rio Puerco Station (Map 1-1). The NMGS-Albuquerque system would be installed in phases: the 500-kV loop in 1990 with commencement of commercial operation of Unit 1, the first 500-kV line with Unit 2 in 1993, and the second 500-kV line with Unit 4 in 1998.

Four routes are considered technically and economically feasible for construction of the 500-kV transmission system. Route T2 is proposed for the first 500-kV line and route T1 is proposed for the second 500-kV line; routes T3 and T4 are alternatives to the Proposed Action. The total distance traversed would be similar for the two proposed and two alternative corridors: 101 miles (T2), 107 miles (T1), 105 miles (T3), and 126 miles (T4). With the exception of tower sites, the proposed 200-foot ROW could support other compatible land uses, such as grazing. PNM would keep the transmission line ROW closed and would patrol the line by helicopter each month. Lands disturbed by heavy equipment and temporary access roads would be restored to their original condition.

Table 1-1 displays construction work force estimates over time. Construction employment for station facilities would reach peaks of 1515 employees in 1987 and 1530 employees in 1992. Operations employment at station facilities would increase steadily, from 30 employees in 1989 to 900 employees in 1999 when all four units are expected to be on-line.

Table 1-1. NMGS CONSTRUCTION AND OPERATION EMPLOYMENT

			NMGS											
			Construction					Operation						
Year	Intake Pipeline and Reservoir	500-kV Transmission Line	Unit 1	Unit 2	Unit 3	Unit 4	Total	Unit 1	Unit 2	Unit 3	Unit 4	Total	Total Employment	Annual Change
1985	—	—	85	—	—	—	85	—	—	—	—	—	85	+85
1986	—	—	800	—	—	—	800	—	—	—	—	—	800	+715
1987	115	—	1515	—	—	—	1630	—	—	—	—	—	1630	+830
1988	295	104	1180	30	—	—	1505	—	—	—	—	—	1505	-125
1989	—	—	360	450	—	—	914	30	—	—	—	30	944	-560
1990	—	—	100	940	40	—	1080	200	—	—	—	200	1280	+336
1991	—	—	—	750	570	—	1320	250	—	—	—	250	1570	+290
1992	—	—	—	270	1260	—	1530	250	24	—	—	274	1804	+234
1993	—	—	—	105	955	30	1090	250	160	—	—	410	1500	-304
1994	—	78	—	—	325	435	838	250	200	30	—	480	1318	-182
1995	—	—	—	—	90	940	1030	250	200	200	—	650	1680	+362
1996	—	—	—	—	—	775	775	250	200	250	—	700	1475	-205
1997	—	—	—	—	—	255	255	250	200	250	24	724	979	-496
1998	—	—	—	—	—	95	95	250	200	250	160	860	955	-24
1999	—	—	—	—	—	—	0	250	200	250	200	900	900	-55

Source: PNM 1980, unpublished data.

According to PNM (unpublished data, 1980), estimated construction employment skill requirements would be as follows:

Skill	Percent of Total Construction Work Force
Boilermakers	9.4
Pipefitters	14.2
Electricians	14.4
Carpenters	5.6
Ironworkers	10.0
Operators	10.0
Laborers	9.0
Teamsters	4.1
Cement masons	0.8
Millwrights	3.3
Insulators	4.0
Sheetmetal workers	1.1
Painters	1.2
Others	0.5
Supervision	12.4

The above estimates are averaged for construction of all four units.

SAN JUAN BASIN ACTION PLAN OVERVIEW AND RELATIONSHIP OF THE NMGS EIS TO ACTIONS INCLUDED IN THE PLAN

The proposed site for the NMGS is located in the San Juan Basin of northwestern New Mexico. The Bureau of Land Management (BLM) is responsible for the management of much of the land and mineral resources in this area, and currently has six separate but interrelated proposals under consideration within the basin. In order to respond to these, the BLM has developed a San Juan Basin Action Plan (SJBAP). This plan provides for the organizational arrangements whereby the environmental analyses and decision making can be implemented in a timely and efficient manner. The plan describes the process for preparation of three site-specific EISs (including the NMGS EIS) and three Environmental Assessments (EAs):

- Coal Preference Right Lease Applications (EA)
- San Juan River Regional Coal Leasing (EIS)
- Wilderness Study Areas (WSAs) (EIS)
- New Mexico Generating Station (EIS)
- Ute Mountain Land Exchange (EA)
- Bisti Coal Lease Exchange (EA)

In addition to these documents, the action plan provides for the preparation of a Cumulative Overview (CO). The CO is intended to focus on the cumulative impacts that would result from the proposed actions analyzed in the EISs and EAs listed above and therefore to facilitate public review and decision making. As a result of this organization, the impact analysis in the NMGS EIS and technical background reports concentrates on the impacts expected to result from the specific NMGS components proposed. The cumulative impacts expected to result from the proposed NMGS, in addition to the cumulative impacts of other proposals to be developed in the same time period, are described in the CO.

BASELINE CONDITIONS ASSUMED FOR THE NMGS TECHNICAL REPORT IMPACT ANALYSES

The site-specific impact analysis for this technical report was based on the affected environment and available resources that would be existing at the time of construction and operation of the NMGS facility. Since construction at the NMGS facility would not begin until 1985, certain assumptions regarding project development in the San Juan Basin were necessary. Two levels of project development were considered, along with criteria for each, in developing a status for the various non-SJBAP actions proposed for the San Juan Basin area.

- Baseline 1 - The projects considered in this level of development are those that have approval and are to be built or under construction in 1985. This level represents the projected existing environment without the proposals included in the SJBAP.

- Baseline 2 - The projects considered in this level are in some phase of the application stage. In this level, Baseline 1 projects are added to any projects in Baseline 2 along with any revision in resource production or uses (e.g., coal).

Where differences in Baselines 1 and 2 affect the results of impact analyses, discussion is provided. If no differences are identified, it should be assumed that consideration of the two different baselines did not alter the impact analyses.

A complete list of projects and comprehensive location maps for Baselines 1 and 2 are provided in Appendix C of the NMGS EIS.

ORGANIZATION OF THE REPORT

Section 2.0 of this technical report describes the assumptions and methodological approach used in the assessment of potential impacts of the Proposed Action on the affected environment. In addition, Section 2.0 contains a definition of the study area and identification of data sources.

Section 3.0, Affected Environment, contains baseline data on existing conditions in the study area, as well as projections of future conditions without the Proposed Action. Information on historical trends is presented where it is useful in providing a basis for predicting most likely future trends. The description of projected future trends takes into consideration the changes in the environment that are expected to occur as a result of the projects identified in Baseline 1. This provides a reasonable estimate of the future existing environment against which the potential impacts of the Proposed Action and alternatives can be assessed.

Section 4.0 describes the potential effects of implementing the Proposed Action and alternatives. Impacts identified are measured against indicators of significance in order to estimate the importance of the impact to the affected human environment. (Potential impacts associated with alternatives to the Proposed Action are compared in Section 9.0.)

In Section 5.0, mitigation measures are suggested. These measures would help to alleviate the potentially significant adverse impacts or enhance the beneficial impacts identified in the Section 4.0 analysis. Those potentially adverse impacts for which no appropriate mitigation measures have been suggested are discussed in Section 6.0 as "unavoidable adverse impacts."

2.0

FRAMEWORK FOR ANALYSIS

DEFINITION OF WILDERNESS

Wilderness is an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5000 acres of land or is of sufficient size to make practicable its preservation and use in an unimpaired condition, and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

GEOGRAPHIC AREA OF INFLUENCE

Impacts to wilderness study areas (WSAs) were assessed for a geographic area that extends 60 miles from all project components. There are nine WSAs within this area of influence that are currently under BLM interim policy management. The interim management will continue until Congress declares the WSA an official wilderness area or drops it from wilderness classification.

INDICATORS OF SIGNIFICANCE

Impacts to wilderness areas include significant changes to the wilderness resource or the wilderness experience that would result from the construction or operation of the NMGS plant facilities, transmission lines, or water system. The basic indicator is whether any of the proposed project features would impair the naturalness of the WSAs; the opportunities for solitude or for primitive and unconfined recreation; or ecological, geologic, or other features of scientific, educational, scenic, or historical value.

This assessment focuses on direct changes to the wilderness resource that could fall within the physical boundaries of any of the nine WSAs in the study region and on project-related consequences outside the WSA boundaries of such magnitude as to significantly affect the qualities of the wilderness experience related to naturalness and solitude. Other consequences identified for this study are directly related to changes in visitor use resulting from the proposed project. Most consequences to the wilderness resource would result from changes identified within other technical disciplines, as follows:

- Air quality--visibility reduction, plume height
- Noise--increase in ambient noise level
- Visual resources--modifications of scenic quality, illumination from night lighting
- Recreation--availability of resources for similar primitive and unconfined activities reduced as population increases
- Socioeconomic--population changes and increased visitor demand

3.0
AFFECTED ENVIRONMENT

INFORMATION AND BACKGROUND

Wilderness is defined in Section 2(c) of the Wilderness Act of 1964 as follows: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain."

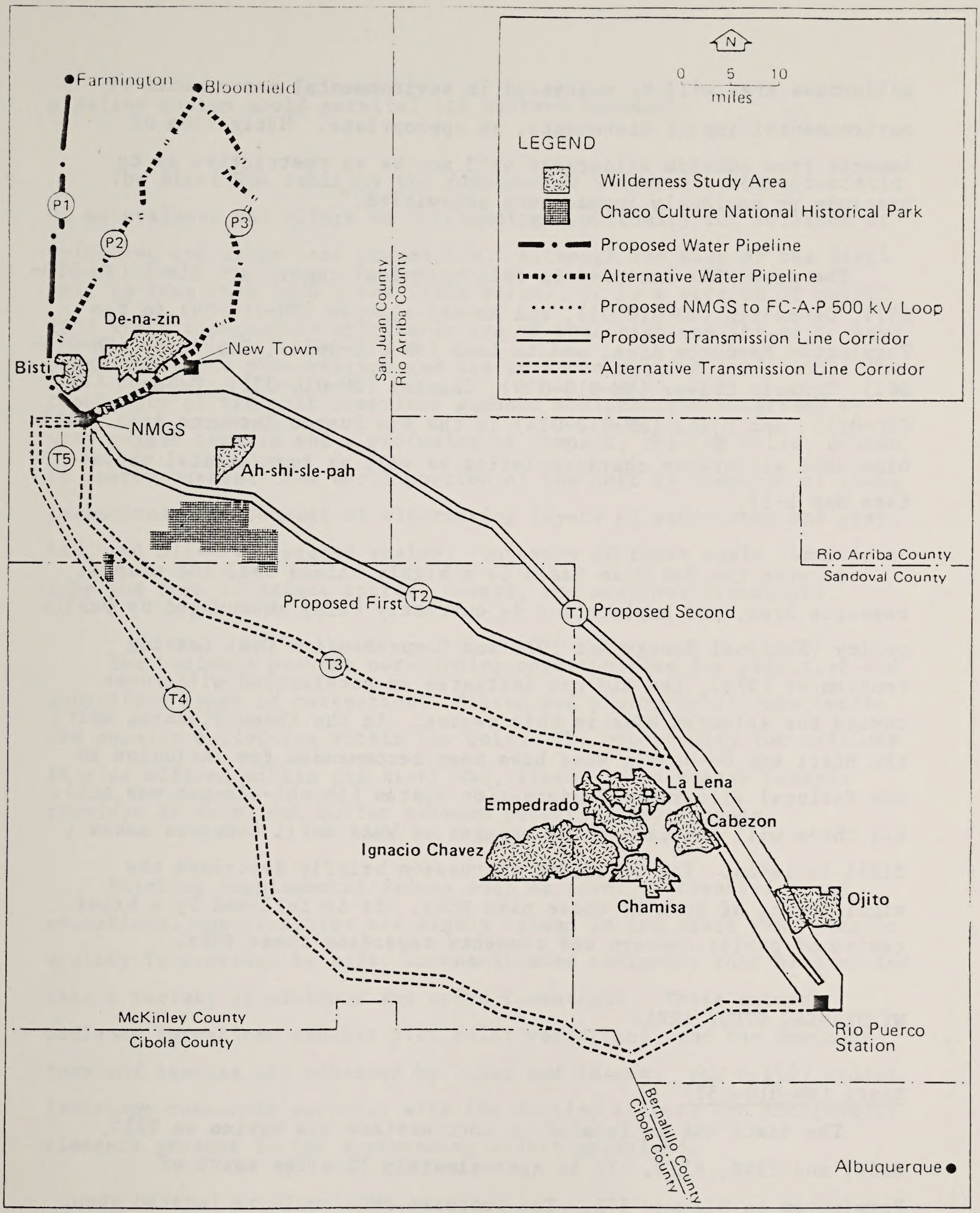
Wilderness resources are areas that are either formally designated or identified for study (e.g., WSA, RARE II) by federal agencies as having particular natural or ecological characteristics of such quality as to be set aside and managed for the purposes of preservation and for historical, scientific, scenic, educational, or unconfined and primitive recreational use by the public. The only wilderness resources that would be affected by the proposed project would be the WSAs under BLM management.

In accordance with the Federal Land Policy and Management Act of 1976 (FLPMA), BLM has been mandated the responsibility of reviewing all roadless areas of public land of 5000 acres or more to determine their suitability for wilderness designation. BLM's role in the wilderness review process involves three phases: inventory, study, and a report of its recommendations to Congress on which WSAs are suitable or unsuitable for wilderness designation. Only Congress can designate areas for inclusion in the National Wilderness Preservation System.

There are nine WSAs within the region of study that are under an interim management policy (Map 3-1). Section 603 of the FLMPA requires BLM to manage lands under wilderness review "in a manner so as not to impair the suitability of such areas for preservation as wilderness . . . subject, however, to the continuation of existing mining and grazing uses and mineral leasing in the manner and degree in which the same was being conducted on the date of approval of this Act. . . ."

Each WSA is studied through BLM's planning system to analyze all values, resources, and uses within the area. The findings of the study, including public participation, determine whether the area will be recommended as suitable or not suitable for designation as wilderness. Following the Management Framework Plan (MFP), an Environmental Impact Statement (EIS) is completed on all wilderness suitability recommendations. Wilderness Analysis Reports are addended to the wilderness EISs. These reports contain most of the specific background information concerning wilderness recommendations. The interim management continues until Congress declares the WSA either an official wilderness area or a nonwilderness area (FLPMA).

BLM's Wilderness Management Policy (BLM 1981a) states that "no buffer zones will be created around wilderness areas to protect them from the influence of activities on adjacent land. The fact that nonwilderness activities or uses can be seen or heard from areas within the wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area. When activities on adjacent public lands are proposed, the specific impacts of those activities upon the wilderness resource and upon public use of the



Map 3-1. GENERAL LOCATION OF WILDERNESS STUDY AREAS

wilderness area will be addressed in environmental assessments or environmental impact statements, as appropriate. Mitigation of impacts from outside wilderness will not be so restrictive as to preclude or seriously impede such activities."

The nine WSAs included in this technical report are Bisti (NM-010-057), De-na-zin (NM-010-04), and Ah-shi-sle-pah (NM-010-09) in the Farmington Resource Area; and La Lena (NM-010-063A), Empedrado (NM-010-063), Ignacio Chavez (NM-010-020), Chamisa (NM-010-021), Cabezon (NM-010-022), and Ojito (NM-010-024) in the Rio Puerco Resource Area. All nine have wilderness characteristics as well as supplemental values (see Map 1-1).

Because the San Juan Basin is a highly valued coal and mineral resource area, and exploration is currently being encouraged by public policy (National Energy Act 1978 and Comprehensive Coal Leasing Program of 1979), the BLM has initiated an accelerated wilderness review for selected WSAs in this region. In the Chaco Planning Unit, the Bisti and De-na-zin WSAs have been recommended for inclusion in the National Wilderness Preservation System (Ah-shi-sle-pah was not). All three will continue to be managed as WSAs until Congress makes a final decision. The following discussion briefly describes the significance of each of these nine WSAs. It is followed by a brief review of public concern and comments regarding these WSAs.

WILDERNESS STUDY AREAS

Bisti (NM-010-057)

The Bisti WSA is located in northwestern New Mexico on T23N, R13W, and T24N, R13W. It is approximately 32 miles south of Farmington on Highway 371. The proposed NMGS would be located about 3 miles southeast of the Bisti WSA, and two of the proposed water pipeline routes would parallel its western boundary.

The Bisti WSA exhibits the fundamental wilderness characteristic of naturalness and offers an outstanding opportunity for solitude or primitive and unconfined recreation. Although the size of the Bisti unit is less than 5000 acres (3968 acres), it is a stretch of public land whose topographic attributes are of such high quality as to make practicable its preservation and use in an unimpaired condition. The topography of the unit comprises exposed badlands characterized by very rugged terrain and a profusion of compact, rolling hills, broken by narrow washes. The north portion of the unit is composed of shale formations that consist of alternating layers of sandstones and gray, tan, and olive variegated shales. Outcrops of these shale formations take the form of unique spires, towers, and mushroom formations.

The badlands provide outstanding opportunities for primitive and unconfined types of recreation. Hiking and photographic experiences are popular activities within the unit. The opportunity for solitude is also offered within the Bisti WSA, since varied rugged terrain provides an excellent buffer between potential user groups.

Existing supplemental values such as scenic, scientific, and educational opportunities are highly valued in the Bisti WSA. Scenic quality is provided by soft, unconsolidated sediments that have eroded into a variety of mushroom and spire formations. These natural badlands formations exhibit rich color variations, and the dominant form and texture are enhanced by light and shadow. The highly eroded landscape contrasts markedly with the mottled texture and homogeneous elements present in the surrounding desert grassland.

The scientific and educational opportunities are provided by the pronounced geologic formations and paleontologic resources, such as a range of fossils and petrified wood.

De-na-zin (NM-010-04)

The De-na-zin WSA is located in T24N and T25N, R12W and R11W. The De-na-zin is accessible from Farmington by taking Highway 371 or 44 and connecting with County Road 15. The De-na-zin WSA is 19,922 acres and is of sufficient size to make practicable its preservation and use in an unimpaired condition. De-na-zin is composed of the Fruitland/Kirtland shale formation, which consists of alternating layers of sandstones and gray, tan, and olive variegated shales. The unit is cut by Alamo Wash and Willow Wash in the center and north sections, and by De-na-zin Wash in the south portion. These major washes and their tributaries wind among rugged badlands, exposing green and gray siltstone and shale. The northern one-fourth of De-na-zin progresses from badland topography into rolling grasslands.

The De-na-zin generally appears to be natural. The dominant human modifications within the unit are trespass routes. Mitigation has been negotiated through the BLM lands and minerals trespass policies. Impacts resulting from pre-FLPMA management policies, such as oil and gas wellheads, are well buffered by the surrounding vegetation and topography.

Most of the unit consists of broken, rough, badland topography, which provides an outstanding opportunity for a variety of user groups to avoid the sights, sounds, and evidence of one another. The large size of De-na-zin also strongly enhances the wilderness characteristic of solitude.

The opportunity for primitive and unconfined types of recreation experiences is notable throughout the major part of De-na-zin. The nature of the topography offers unusual and high-quality opportunities for hiking, riding, and photography. Landscapes within De-na-zin offer an unusual visual experience not found in most land within the public domain. Though similar landscape features exist elsewhere (Utah and Wyoming), many of these are on private land, do not offer such expansive resources, or are beyond a day's travel distance from the communities of influence.

Existing supplemental values include scenic, scientific, and educational opportunities. The sandstone-capped bluffs and mesas intermingled with the spires and mushroom formations make this unit scenically appealing. De-na-zin's paleontological resources are most important. The area contains the transition from the Fruitland/Kirtland formation, once dinosaur-dominated, to the Ojo Alamo and Nacimiento formations, which were mammal-dominated. This transition zone is one of the few places in the world where one can document the final stages of the extinction of the dinosaur and the beginning of the age of mammals.

Ah-shi-sle-pah (NM-010-09)

The Ah-shi-sle-pah WSA is located on T22N, R10W, and T23N, R10W. It can be reached by taking Route 44 to Route 57, which parallels the eastern boundary of Ah-shi-sle-pah. The first proposed transmission line (T2) borders this WSA.

The Ah-shi-sle-pah WSA exhibits the fundamental wilderness characteristics of size, naturalness, and the opportunity for solitude or primitive and unconfined recreation. However, the BLM has recommended that the Ah-shi-sle-pah WSA not be considered as suitable for wilderness designation but that the area be managed under Interim Management Plan policy pending submission of the wilderness study to Congress and congressional designation or dismissal. This area is not being recommended for wilderness suitability because it duplicates many of the multiple values contributed by Bisti, often with diminished quality and quantity, and because it contains significant amounts of strippable coal and offers numerous management problems, including contiguous Navajo occupancy and Coal Preference Right Lease Applications (BLM 1981b).

The WSA generally appears to be natural; however, there are a number of man-made intrusions along the eastern boundary. When the unit is viewed as a whole, Ah-shi-sle-pah appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.

Most of the unit consists of badland formations with rolling, intermittent washes. These rougher, more broken badlands provide an excellent opportunity for solitude.

The outstanding opportunity for primitive and unconfined recreation (such as hiking, riding, and photographic experiences) is keyed to the unique topography of the area. Opportunities for sightseeing, related to the supplemental values inherent within the WSA, exist throughout. Petrified wood and fossils, as well as novel geologic formations, provide intrinsic educational opportunities.

La Lena (NM-010-063A)

La Lena WSA is located approximately 7 miles north of the village of Guadalupe in T17N, R3W and R4W; T16N, R3W and R4W. Proposed transmission line T3 would be within 1 mile of the northern boundary; the first proposed transmission line (T2) would be within 2 miles to the east.

La Lena is approximately 9359 acres and consists of broken terrain with steep-sided mesas cut by a network of arroyos. It is bounded on the east by maintained roads and on the south, north, and west by a combination of maintained roads and property boundaries. La Lena WSA has several small retention dams and some evidence of mineral exploration; however, this cumulative impact is not considered significant enough to impair the apparent naturalness of the unit. When the unit is viewed as a whole, it appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.

The opportunity for solitude is well dispersed throughout this WSA. The abundance of small, eroded sandstone canyons and meandering arroyos mingle with steep-sided mesas, which provide the topographic relief necessary to absorb a variety of user groups.

La Lena does offer recreation opportunities, but none that may be characterized as outstanding. The unit also has both scenic and cultural supplemental values.

Empedrado (NM-010-063)

Empedrado is located approximately 4 miles northwest of the village of Guadalupe in T17N, R4W; and T16N, R4W and R3W. The first proposed transmission route (T2) is approximately 6 miles east of the WSA.

Empedrado consists of broken terrain with sandstone mesas and rolling grassland interspersed with intermittent arroyos and washes, including both Torreon Wash and Chico Arroyo. This 8419-acre WSA is bounded on the north, east, and south by maintained roads and on the west by a combination of maintained roads and property boundaries.

Most of the unit appears to be natural. The cumulative impact of the existing intrusions (minimal evidence of mineral exploration and several small retention dams) is not considered to be significant enough to impair the apparent naturalness of the WSA.

The opportunity for solitude is provided by the broken terrain. Winding washes and steep-sided mesas offer ample opportunity for the user to experience a feeling of remoteness and isolation.

Although the Empedrado WSA does offer opportunities for recreation, no single recreation opportunity is considered to be outstanding. The WSA has both scenic and cultural supplemental values.

Ignacio Chavez (NM-010-020)

The Ignacio Chavez WSA, located approximately 6 miles due west of the village of Guadalupe, consists of expansive mesa tops, steep hills and cliffs, and rolling foothills. It also exhibits an excellent example of several abrupt environmental transition zones.

Ignacio Chavez is 32,248 acres in size. It is bounded on the west and east by maintained dirt roads and on the south by the Cibola National Forest.

The Ignacio Chavez WSA exhibits some imprints of man, primarily grazing improvements and two-track vehicular ways; however, the cumulative impact is not considered to be significant. The unit as a whole appears to be natural.

The large size, rugged terrain, and abundant vegetation provide an outstanding opportunity for solitude. Mesa tops, rugged canyons, and rolling foothills provide a more than adequate setting for the absorption of a large number of user groups.

Ignacio Chavez provides outstanding opportunities for primitive and unconfined recreation, including backpacking, hunting, photography, sightseeing, and horseback riding. The unit contains several significant cultural sites, as well as unique wildlife and scenic values.

Chamisa (NM-010-021)

The Chamisa WSA is located approximately 21 air miles southwest of San Ysidro and is contiguous with the village of Guadalupe. The unit to the east consists of rolling foothills, cut by Guadalupe Canyon and Canon Chamisa. As the unit progresses west, it climbs in elevation and culminates in a mesa top. Coinciding with the 1800-foot increase in elevation is a variety of vegetation; grasses, cacti, and shrubs intermingle and give way to ponderosa pine and pinyon-juniper cover.

This 11,091-acre WSA is bounded on the north and east by maintained roads, on the south by the Cibola National Forest, and on the west by a combination of a maintained road and the edge of the mesa top.

Chamisa generally appears natural. It contains primarily a few range developments; however, their cumulative impact is not substantially noticeable in the unit as a whole.

This WSA provides an outstanding opportunity for solitude. The variety of topography and vegetation inherent within the unit significantly enhance this feeling of solitude. The variety of terrain also provides an outstanding opportunity for hiking and sightseeing.

Chamisa has scenic values derived from the variety of topography, as well as cultural resources (both prehistoric and Spanish Colonial).

Cabezon (NM-010-022)

The Cabezon WSA is located approximately 15 air miles due west of San Ysidro, in T16N, R3W and R2W; and T15N, R2W. Cabezon is 7235 acres in size and consists of a volcanic plug 8000 feet high that is surrounded by rolling hills cut by a network of arroyos. The corridor of the first proposed transmission line (T2) overlaps the eastern portion of this WSA; however, under BLM Interim Management Guidelines, no transmission line could be located within the WSA. The eastern boundary is currently bounded by a power line rights-of-way (NM559354) and unimproved dirt roads.

The unique geology of the Cabezon WSA provides an outstanding opportunity for those who choose to climb the peak itself or wander among the foothills. The peak provides a topographic buffer that allows users to avoid the sights and sounds of others. It also offers an excellent panoramic view, unavailable from other perspectives, of surrounding landscapes.

Cabezon offers the opportunity for primitive and unconfined recreation. The area offers an opportunity for sightseeing and photography related to scenic, geologic, and cultural values. Cabezon is a unique geologic feature and has two prehistoric shrines on top of the peak; thus Cabezon offers educational and scientific supplemental values.

Ojito (NM-010-024)

The Ojito WSA is located approximately 5 miles southwest of the village of San Ysidro in T15N, R1W and R1E. The corridor of the second proposed transmission line (T1) overlaps the far western portion of the WSA; however, under BLM Interim Management Guidelines, no transmission line could be located within the WSA.

This 11,200-acre WSA consists of steep and rocky terrain cut by several steep canyons. It is bounded on the north by property boundaries, on the west by power line rights-of-way, on the south by a combination of county-maintained road and gas pipeline rights-of-way, and on the east by a combination of maintained road and ridgeline.

Several earthen dams are well buffered by the steep and rocky terrain, thus leaving these intrusions substantially unnoticeable. The WSA is primarily affected by the forces of nature and is, therefore, natural.

The combination of the rocky, rugged terrain and few intrusions provides the opportunity for solitude. Outstanding opportunities for primitive and unconfined types of recreation also exist.

Supplemental values are provided by the abundance of prehistoric and historic sites and a few paleontological resources, as well as high-quality scenic values.

PUBLIC INVOLVEMENT

Public involvement plays a critical role in the formulation of wilderness policy: "In determining whether an area is suitable or nonsuitable for wilderness designation, the BLM wilderness study process will consider comments received from interested and affected publics at all levels--local, state, regional, and national--with special consideration given to the involvement of those local peoples and institutions that would be most directly affected by an area's designation. Wilderness recommendations will not be based solely on a vote-counting majority rule system. The BLM will develop its recommendations by considering public comment in conjunction with a full analysis of a wilderness study area's multiple resource and socioeconomic values and uses" (BLM 1980a).

In 1979, public comments were solicited for the Bisti WSA, De-na-zin WSA and Ah-shi-sle-pah WSA. During the spring and early summer of 1980, the New Mexico State Office of the BLM asked the public to comment on the other WSAs in the state. Public comments on the WSA proposals were solicited in a variety of ways, including open houses, public meetings, personal contacts, and written comments. The BLM received about 700 personal messages, 700 form letters, and 2300 coupons. (These coupons were attached to a poster that was distributed nationally by a special interest group. People were asked to remove the coupon, which had a standard printed message, sign it and send it to the appropriate State Director.) Table 3-1 shows the balance of opinion from these responses on the concept of wilderness in general. A large majority of responses favored wilderness designation for purposes of protection and preservation for future generations. Tables 3-2 and 3-3 list various other reasons that people favored or opposed wilderness in general. Summaries of public response pertaining to eight of the nine WSAs in the study area are shown in Tables 3-4 through 3-11 (the Bisti, De-na-zin, and Ah-shi-sle-pah WSAs were not represented in these summaries because public input had been gathered earlier on these three resource areas). The tabulated responses on Tables 3-4 and 3-5 represent unsolicited responses for these areas and are not representative of actual input.

The Star Lake-Bisti Regional Coal Environmental Statement (BLM 1979a) discussed the Bisti, De-na-zin, and Ah-shi-sle-pah WSAs. A Wilderness Draft EIS is scheduled for release by November 30, 1982, and the Final EIS in April 1983. Public meetings have been held in Taos, Albuquerque, and Farmington. Approximately 38 individuals made

Table 3-1. BALANCE OF OPINION ON THE CONCEPT OF WILDERNESS IN GENERAL

	Inputs	Signatures
Favor	114	112
Oppose	52	59
Conditional[1]	8	7
Comments[2]	20	20
Total	194	198

Source: BLM 1980b.

[1] Conditional comments are those favoring wilderness under certain circumstances.

[2] Some respondents offered a general comment that does not fall into any of the other categories.

Table 3-2. REASONS FAVORING WILDERNESS IN GENERAL

Inputs	Signatures	Reasons
27	21	Wild lands belong to all Americans and should be protected from exploitation.
12	13	Wilderness should be preserved for ourselves and future generations.
7	1	To some "flat and bare is beautiful." Desert rat aesthetic may not be pervasive, but it is legitimate.
5	5	We need to preserve wilderness in America.
5	5	Preserve as much wilderness as possible.
5	5	Wilderness is an irreplaceable resource.
5	5	Wilderness is needed to protect plants and wildlife.
2	3	Wilderness offers spiritual and psychological renewal.
2	2	Wilderness is our most valuable resource.
2	2	Wilderness needs to be protected from destruction.
1	2	Keep an ecological balance.
1	1	Preserve wilderness for historic preservation.
1	1	These areas are the heritage of all Americans.
1	1	Wilderness perpetuates traditional lifestyles and uses of the land, which is desirable.
1	1	Set aside wilderness on BLM lands to preserve our fragile environment and reduce our oversupply of beef.
1	1	People, through Congress, have supported wilderness as a land designation. It is not a western phenomenon, but also takes place in the east.
1	1	Westerners do not appreciate how fortunate they are in having a wealth of undeveloped areas.
1	1	We should be proud of our New Mexico wilderness areas.
1	1	BLM has too often been the "Bureau of Livestock and Mining" when it comes to managing public lands. Wilderness and wildlife have usually taken a back seat to fulfilling the desires of commercial interests.
1	1	Protect lands from development.
1	1	Increased ecological pressures.
1	1	Importance of preserving lands for future study and enjoyment outweigh any economic arguments for exclusion.
2	1	Don't let development interests take our very best lands.
1	1	"I'm just plain in favor a wilderness area."
1	1	"I support the idea and need for wilderness."
1	1	Buffer against pollution.
1	1	Preserve for wilderness recreation.
1	1	There are plenty of lands available for consumptive use.
30	30	No supporting reasons offered.

Source: BLM 1980b.

Table 3-3. REASONS OPPOSING WILDERNESS IN GENERAL

Inputs	Signatures	Reasons
18	20	Wilderness will prevent development of energy and mineral resources.
5	6	Wilderness will deny access to the elderly, handicapped, and rockhounds.
4	9	Wilderness discriminates against many for the benefit of a few.
4	4	Wilderness locks out taxpayers and creates hardships for the economy, ranchers, and mineral exploration.
4	3	Land should not be taken from productive agricultural use just to make a wilderness.
1	1	Wilderness will conflict with the development of private mineral resources.
1	1	Conflicts with flood control.
1	1	Would interfere with use of state inholdings.
1	1	Wilderness is not conducive to wildlife management.
2	2	Wilderness has adverse economic impacts.
1	1	Wilderness visitors will eventually crowd out the cowman.
1	1	Wilderness will decrease the value of adjacent lands.
1	1	State has enough wilderness.
1	1	Wilderness is a waste of money.
1	1	Lands have been well-used without turning into wilderness.
1	1	Objects to any wilderness in New Mexico.
1	1	Wilderness areas are a step not into the future but into the past.
1	1	Local people don't want any more wilderness.
1	1	Wilderness would conflict with hunting.
4	4	No supporting reasons offered.

Source: BLM 1980b.

Table 3-4. PUBLIC RESPONSE SUMMARY

Unit Number: NM-010-04

Unit Name: De-na-zin

Favor Wilderness Study		Oppose Wilderness Designation or Wilderness Study Status	
I	S	I	S
1	1	1	6

I	S	Supporting Reasons	I	S	Supporting Reasons
1	1	Manageable as wilderness	1	6	Does not appear to be natural
1	1	No supporting reasons offered			

Source: BLM 1980b.

Key: I = inputs
S = signatures

Table 3-5. PUBLIC RESPONSE SUMMARY

Unit Number: NM-010-09

Unit Name: Ah-shi-sle-pah

Favor Wilderness Study		Oppose Wilderness Designation or Wilderness Study Status	
I	S	I	S
1	1	1	6

I	S	Supporting Reasons	I	S	Supporting Reasons
1	1	Manageable as wilderness	1	6	No supporting reasons offered
1	1	No supporting reasons offered			

Source: BLM 1980b.

Table 3-6. PUBLIC RESPONSE SUMMARY

Unit Number: NM-010-63A Unit Name: La Lena

Favor Wilderness Study			Oppose Wilderness Designation or Wilderness Study Status		
I	S		I	S	
10	10		3	8	
I	S	Supporting Reasons	I	S	Supporting Reasons
3	3	Meets naturalness criterion	1	6	Does not appear to be natural
3	3	Offers opportunities for solitude	1	1	Resource conflicts
3	3	Offers opportunities for recreation	1	1	No supporting reasons offered
1	1	Manageable as wilderness			
7	7	No supporting reasons offered			
I	S	Form Letters & Petititons	I	S	Form Letters & Petitions
2524	2659	Endorsements of conservationist proposal			
1	615	Petition endorsing conservationist proposal			

Source: BLM 1980b.

Table 3-7. PUBLIC RESPONSE SUMMARY

Unit Number: NM-010-63 Unit Name: Empedrado

Favor Wilderness Study			Oppose Wilderness Designation or Wilderness Study Status		
I	S		I	S	
10	10		4	9	
I	S	Supporting Reasons	I	S	Supporting Reasons
3	3	Meets naturalness criterion	1	6	Does not appear to be natural
3	3	Offers opportunities for solitude	1	1	Range impacts
			1	1	Resource conflicts
3	3	Offers opportunities for recreation	1	1	Not manageable as wilderness
1	1	Manageable as wilderness	1	1	No supporting reasons offered
7	7	No supporting reasons offered			
I	S	Form Letters & Petitions	I	S	Form Letters & Petitions
2524	2659	Endorsements of conservationist proposal			
1	615	Petition endorsing conservationist proposal			

Source: BLM 1980b.

Table 3-8. PUBLIC RESPONSE SUMMARY

Unit Number: NM-010-20 Unit Name: Ignacio Chavez

Favor Wilderness Study			Oppose Wilderness Designation or Wilderness Study Status		
I	S		I	S	
14	14		7	12	
I	S	Supporting Reasons	I	S	Supporting Reasons
1	1	Meets size criterion	2	7	Does not appear to be natural
4	4	Meets naturalness criterion	4	4	Resource conflicts
1	1	Other insignificant intrusions			
4	4	Offers opportunities for solitude			
4	4	Offers opportunities for recreation			
2	2	Supplemental values			
1	1	Manageable as wilderness			
7	7	No supporting reasons offered			
I	S	Form Letters & Petitions	I	S	Form Letters & Petitions
2524	2659	Endorsements of conservationist proposal			
1	615	Petition endorsing conservationist proposal			

Source: BLM 1980b.

Table 3-9. PUBLIC RESPONSE SUMMARY

Unit Number: NM-010-21 Unit Name: Chamisa

Favor Wilderness Study			Oppose Wilderness Designation or Wilderness Study Status		
I	S		I	S	
14	14		6	6	
I	S	Supporting Reasons	I	S	Supporting Reasons
7	7	Meets naturalness criterion	2	2	Does not appear to be natural
6	6	Offers opportunities for solitude	1	1	Range impacts
			4	4	Resource conflicts
6	6	Offers opportunities for recreation	4	4	Wilderness management
2	2	Manageable as wilderness			
7	7	No supporting reasons offered			
I	S	Form Letters & Petitions	I	S	Form Letters & Petitions
2524	2659	Endorsements of conservationist proposal			
1	615	Petition endorsing conservationist proposal			

Source: BLM 1980b.

Table 3-10. PUBLIC RESPONSE SUMMARY

Unit Number: NM-010-22 Unit Name: Cabezon

Favor Wilderness Study			Oppose Wilderness Designation or Wilderness Study Status		
I	S		I	S	
18	18		4	9	
I	S	Supporting Reasons	I	S	Supporting Reasons
8	8	Meets naturalness criterion	1	6	Does not appear to be natural
8	8	Offers opportunities for solitude	3	3	Resource conflicts
			2	2	Not manageable as wilderness
7	7	Offers opportunities for recreation			
3	3	Supplemental values			
1	1	Resource conflicts			
8	8	No supporting reasons offered			
I	S	Form Letters & Petitions	I	S	Form Letters & Petitions
2524	2659	Endorsements of conservationist proposal			
1	615	Petition endorsing Conservationist proposal			

Source: BLM 1980b.

Table 3-11. PUBLIC RESPONSE SUMMARY

Unit Number: NM-010-24 Unit Name: Ojito

Favor Wilderness Study		Oppose Wilderness Designation or Wilderness Study Status	
I	S	I	S
29	28	4	9

I	S	Supporting Reasons	I	S	Supporting Reasons
1	1	Meets size criterion	3	8	Does not appear to be natural
1	1	Over 5,000 acres			
1	1	Sufficient size to be managed as wilderness	1	1	Range impacts
17	16	Meets naturalness criterion	1	1	Offers no opportunities for solitude
3	1	Insignificant mining impacts	1	1	Offers no opportunities for recreation
18	17	Offers opportunities for solitude	1	1	No supporting reasons offered
15	14	Offers opportunities for recreation			
15	14	Supplemental values			
9	7	Manageable as wilderness			
9	9	No supporting reasons offered			

I	S	Form Letters & Petitions	I	S	Form Letters & Petitions
2524	2659	Endorsements of conservationist proposal			
1	615	Petition endorsing conservationist proposal			

Source: BLM 1980b.

statements during the public hearing in Albuquerque; of these, 16 were in favor of the WSAs and 22 were opposed. Many of the individuals attending the workshops represented private groups that have a vested interest in the area; for example, coal miners, representatives of energy firms, and construction workers, as well as representatives of public interest and environmental groups concerned about specific aspects of development (Sierra Club, Wilderness Society). One common reason mentioned in opposition to these areas becoming wilderness was the need or desire to have the natural resources (coal, uranium, etc.) developed. Opponents also questioned the need for more wilderness land. Others felt this area was not unique to New Mexico and therefore should not be wilderness. Some reasons mentioned in favor of these areas becoming wilderness pertained to the areas' nonrenewable resource of unique scenic and scientific value and the need to preserve such areas for future generations (BLM 1979b).

BLM has reported that the depth and breadth of public comment on the suitability of these areas for wilderness designation have been outstanding. The Bisti Badlands received overwhelming public support during the wilderness inventories conducted in 1979. On nearly every occasion for public involvement, individuals have spoken strongly in favor of preserving these areas.

BLM has also received a steady, if lesser, stream of correspondence opposing wilderness preservation in areas of energy and mineral interest. Groups such as New Mexicans for Jobs and Energy have opposed wilderness designations chiefly on the grounds of overriding national needs for energy, but have also argued that these areas already show signs of human intrusion and that scenic, wildlife, paleontological, and archaeological values associated with these areas have been exaggerated (BLM 1981b).

Public Demand for Wilderness Areas

National trends show an increased demand for wilderness. The Chaco Management Framework Plan (1981b) references several studies indicating that use of the wilderness resource in San Juan County has steadily increased. The MFP cites a 1973 study by Hendee and Stankey which claims that wilderness use continues to grow between 10 and 25 percent a year. Also cited in the MFP is a study by John Loomis indicating that the tastes and preferences of the increasing population point to an increasing demand for wilderness recreation. A study by Peterson (1981), "Trends in Recreational Use of National Forest Wilderness", reports that visitor use of areas designated wilderness by 1965 has almost doubled, increasing 82 percent in 15 years.

The estimated participation in activities associated with wilderness resources is based on the population of communities within a day's driving distance from the resources and the type and number of other available resources of similar characteristics and value. The population in the Four Corners area is expected to increase by 37 percent by 1990 and by 72 percent by the year 2000. The Bisti, De-na-zin, and Ah-shi-sle-pah WSAs are in New Mexico State Planning District 1. The other six WSAs (La Lena, Empedrado, Ignacio Chavez, Chamisa, Cabezon, and Ojito) are in New Mexico State Planning District 3. Table 3-12 shows the projected demand rate for specific activities for the entire Chaco Planning Unit. It is projected that in 1990 the participation (expressed in numbers of persons) in Planning District 1 for sightseeing will be 206,000; photography/ painting, 224,000; backpacking, 12,000; hiking, 157,000; camping, 97,000; and picnicking, 209,000. In Planning District 3 the demand projections for 1990 are: 1,236,000 for sightseeing, 1,404,000 for photography/painting, 148,000 for backpacking, 571,000 for hiking, 527,000 for camping, and 1,050,000 for picnicking. These figures indicate an overall 15 to 20

Table 3-12. DEMAND PROJECTIONS

Planning District 1

Activity	1980	1985	1990	Increase
Sightseeing	179,000	192,000	206,000	15%
Photography/Painting	194,000	209,000	224,000	15%
Backpacking	10,000	11,000	12,000	20%
Hiking	136,000	147,000	157,000	15%
Camping	83,000	90,000	97,000	17%
Picnicking	182,000	195,000	209,000	15%

Planning District 3

Activity	1980	1985	1990	Increase
Sightseeing	1,043,000	1,138,000	1,236,000	19%
Photography/Painting	1,186,000	1,293,000	1,404,000	18%
Backpacking	125,000	137,000	148,000	18%
Hiking	482,000	526,000	571,000	18%
Camping	445,000	485,000	527,000	18%
Picnicking	887,000	967,000	1,050,000	18%

Source: New Mexico State Planning Office 1976.

percent increase in activities associated with wilderness resources. The increase could be initially higher due to trends which indicate that the action of inventorying and identifying potential wilderness--thus publicizing the locations of wilderness study areas--could increase the use of such areas.

4.0
ENVIRONMENTAL CONSEQUENCES

OVERVIEW AND BACKGROUND

The Final Wilderness Management Policy (BLM 1981a) specifically states that "no buffer zones will be created around wilderness areas to protect them from the influence of activities on adjacent land. The fact that nonwilderness activities or uses can be seen or heard from areas within the wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area. . . . Mitigation of impacts from outside wilderness will not be so restrictive as to preclude or seriously impede such activities."

Further, the BLM Policies, Criteria, and Guidelines for Conducting Wilderness Studies on Public Lands (BLM 1980a) states that "the reasonable standard to be applied with regard to outside sights and sounds is to determine whether they have such an imposing effect as to outweigh any benefits of wilderness designation. BLM (1980a) also refers to a case study of the Sandia Mountain Wilderness in New Mexico in which a congressional report (House Report No. 95-540) states: "The sights and sounds of nearby Albuquerque, formerly considered a bar to wilderness designation by the Forest Service, should, on the contrary, heighten the public's awareness and appreciation of the area's outstanding wilderness values."

Naturalness and opportunities for solitude are two of the primary characteristics for determining wilderness designation, but criteria for determining which activities would significantly impair these characteristics are not clear-cut. The BLM guidelines imply that the size (the standard minimum is 5000 acres) of the WSA and its topography and vegetation are assumed to provide some screening of outside intrusions for the wilderness visitor, at least from all but the higher-elevation vista points and the perimeter areas. Consequently, this study focuses on direct changes to the wilderness resource that could fall within the physical boundaries of any of the nine WSAs in the study region and on project-related consequences outside the WSA boundaries of such magnitude as to significantly affect the qualities of the wilderness experience related to naturalness and solitude. Other consequences identified for this study are directly related to changes in visitor use resulting from the proposed project. Most consequences to the wilderness resources would result from changes identified within other technical disciplines, as follows:

- Air quality--visibility reduction, plume height
- Visual resources--modifications of scenic quality, illumination from night lighting
- Recreation--availability of resources for similar primitive and unconfined activities within one day's travel distance of communities of residence
- Socioeconomic--population changes and increased visitor demand

Wilderness consequences are discussed below for each project component.

NMGS PLANT

Both the Bisti and De-na-zin WSAs would be significantly affected by the construction and operation of NMGS. Distance from the proposed site, topographic relief, expansiveness within the WSAs, and other physical characteristics of these two WSAs would result in slightly different consequences for each area. Consequences would be most noticeable at the higher elevations along the portions of the WSAs closest to the plant site.

Because of the Bisti WSA's proximity to the proposed plant site (within 3 miles), and to the major access road from the north (NM 371), the quality of the wilderness experience within the study area would be significantly impaired. Though the Sandia Mountain Wilderness case (discussed previously) showed that wilderness characteristics can in some instances coexist with human development, the sharp contrast presented in this situation between the plant and an otherwise natural setting in the context of the existing and publicized opportunities for solitude would not meet visitor expectations for the area. As discussed in the Visual Resources Technical Report, the top one-third of the boiler stacks (and, during some periods, the plumes as well) would be visible looking to the southeast from the higher elevations within the Bisti WSA, clearly adding the imprint of man's work to the otherwise natural landscape. Occasional discernible noise from construction equipment or heavy roadway traffic could further influence a visitor's perception of naturalness.

Night lighting of the plant would appear as an illuminated field over the site as seen from within the Bisti WSA and would affect the quality of primitive and unconfined recreation (particularly overnight camping and evening hiking). Increased motor vehicle traffic (Highway

371) or rail transport along the western border of the WSA would generate daytime noise and night illumination for visitors on the western side of the Bisti WSA. When considered separately, these impacts may appear insignificant; however, when considered in total, their overall effect on the quality of the wilderness experience would significantly impair wilderness characteristics.

The De-na-zin WSA, located approximately 6 miles northeast of the proposed plant site but at a slightly higher elevation, would be most affected by visual contrasts viewed against the distant landscape of the Chuska Mountains to the southwest.

Other consequences to the Bisti and De-na-zin WSAs from NMGS would be associated with the work force and subsequent increases in visitor use. Overcrowding would directly affect opportunities for solitude, even though the enclosed pockets formed by the natural terrain provide numerous opportunities for visitors to find a secluded spot. Litter, vandalism, and unauthorized use of off-road vehicles (ORV) could also result from rapid increases in use of the WSAs. The need for sanitation facilities, parking areas, and supervision would accompany increased visitor use, resulting in additional budget requirements for BLM.

TRANSMISSION LINES

Though the actual lines are indicated as paralleling the outside boundary of the WSAs, two of the transmission corridors cross into WSA boundaries (Ojito and Cabezon WSAs). However, under BLM Interim Management Guidelines, no transmission lines could be located within the WSAs.

Because of the topography and orientation of the Ojito WSA, the T1 line would not significantly impair the wilderness characteristics. Only the top portion of the four to six towers would be visible from the highest elevations within the WSA (Bernalillito Mesa), looking toward Cabezon Peak to the northwest. Since this vista point is not one of the primary scenic spots within the study area, the consequence is not considered significant (see the Visual Resources Technical Report).

The T2 line, however, would have significant scenic consequences as viewed from Cabezon Peak. Since one of the primary uses of the WSA is climbing the volcanic plug for a scenic view of the surrounding landscapes, the visual imprint of man's work would impair the scenic and natural character of the scenery (see the Visual Resources Technical Report).

Short portions of the T1 and T2 transmission corridors would come within 3 miles of the De-na-zin, Ah-shi-sle-pah, and La Lena WSAs. These portions would not significantly impair wilderness characteristics, but they would change the scenic quality of the surrounding landscape as viewed from elevated portions along the southern border of De-na-zin, from the southern tip of Ah-shi-sle-pah, and from the northwestern corner of La Lena.

Access roads developed during construction of transmission lines often result in increased traffic even after construction. This could introduce new access routes to the WSAs and result in additional visual contrasts.

WATER SUPPLY SYSTEM

No consequences have been identified for the water pipelines or the gathering system for this project. None of the water system components would cross WSA boundaries, and none would significantly impair wilderness characteristics. No new access roads would be built for pipeline segments along WSAs.

5.0
MITIGATION MEASURES

Mitigation suggestions[*] for wilderness consequences include the following:

- BLM could increase supervision and maintenance of the Bisti and De-na-zin WSAs and consider adding sanitary facilities and waste receptacles at entry points (minimum tools).

- Trails and ways within the Bisti and De-na-zin WSAs could be designed to direct visitors away from areas where vistas of the plant on stacks would be most prominent.

- PNM could initiate a study effort in cooperation with BLM to determine types of use and volume of use and develop a management plan for protecting the resource during peak employment years. Use capacity per day for the Bisti and De-na-zin WSAs could be established as a part of the management plan.

- PNM could provide information to employees and contractors regarding the fragile nature of wilderness areas and visitors' responsibilities. PNM could also identify other recreation resources in the 5-hour travel distance study area for employee use.

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*See the Visual Resources Technical Report for a discussion on mitigation of transmission line consequences and the Air Quality Technical Report for mitigation of noise impacts to the Bisti WSA.

- Access roads used for transmission line construction and off-road hauling of equipment to the site should be closed and reclaimed following construction.

- Upon retirement of the NMGS, PNM should be committed to removing the stacks, transmission towers and lines, and all other structures visible from the WSAs.

6.0

UNAVOIDABLE ADVERSE IMPACTS

The quality of the wilderness experience within the Bisti, De-na-zin, and Cabezon WSAs would be unavoidably impaired by the sights and sounds associated with the construction of NMGS and the T2 transmission line.

7.0

RELATIONSHIPS BETWEEN THE SHORT-TERM USE OF THE AFFECTED ENVIRONMENT AND THE LONG-TERM PRODUCTIVITY

The sights and sounds and increased visitor use resulting from the NMGS project components and work force would be present during the 40-year project life. The qualities of the wilderness experience would be impaired until restored to natural conditions after project abandonment.

8.0

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

All consequences to WSAs associated with NMGS project components and work force would be reversible and retrievable following project abandonment.

9.0

COMPARISON OF ALTERNATIVES

The no-action alternative would have no consequences to the Bisti and De-na-zin WSAs in proximity to the proposed site. Other WSAs could be affected, however, if alternative power generation facilities are initiated elsewhere in the region.

There were no significant consequences to wilderness resources identified from alternative water supply components.

Because of the topography and orientation of the Ojito WSA, the T1 line would not significantly impair the wilderness characteristics. Only the top portion of the four to six towers would be visible from the highest elevations within the WSA (Bernalillito Mesa), looking toward Cabezon Peak to the northwest. Since this vista point is not one of the primary scenic spots within the study area, the consequence is not considered significant because the transmission line segment most visible from the Ojito WSA would meet the BLM's VRM objectives (see the Visual Resources Technical Report).

The T2 line, however, would have significant scenic consequences as viewed from Cabezon Peak. Since one of the primary uses of the WSA is climbing the volcanic plug for a scenic view of the surrounding landscapes, the visual imprint of man's work would impair the scenic and natural character of the scenery (see the Visual Resources Technical Report).

POSSIBLE NEW TOWN

1.0

AFFECTED ENVIRONMENT

The De-na-zin WSA lies in the general vicinity of the site that would be considered for the building of a possible new town. This WSA occupies 19,000 acres of badlands formation that possesses outstanding scenic qualities as well as valued paleontological resources. The area exhibits rich colors, forms, and texture variation, ranging from light bleached sands to mounds having black and purple soil colors. The natural formations, the presence of petrified logs and fossils, and the expansiveness of the untouched area, all combine to make the De-na-zin WSA highly valued for scenic, educational, and recreation purposes.

The De-na-zin WSA has a visual quality rating of Class A, a high visual sensitivity, and is in a Class II VRM area.

2.0

ENVIRONMENTAL CONSEQUENCES

If a new town were located in the general proximity of the Bisti and De-na-zin WSAs, significant consequences could result both from its physical presence and from increased use of the wilderness resources by the new town's residents. The physical presence of a new town, if visible from vistas within the WSA, could impair the scenic quality and natural character of the background landscape. Increased visitation, traffic noise, and illumination would affect opportunities for solitude. Increased visitor use could result in litter, vandalism, and unauthorized use of ORVs in the WSAs, requiring additional supervision and maintenance from BLM.

GLOSSARY

Contiguous lands--lands or legal subdivisions having a common boundary. Lands having only a common corner are not contiguous.

FLPMA--Federal Land Policy and Management Act of 1976, which mandated the BLM Wilderness Review. Often referred to and pronounced "FLIPMA."

Naturalness--refers to an area which "generally appears to have been affected primarily by the forces of nature with the imprints of man's work substantially unnoticeable."

Primitive and Unconfined Recreation--non-motorized and nondeveloped types of outdoor recreational activities such as hiking, horseback riding, photographic experiences, sightseeing, etc.

Roadless--refers to the absence of roads which have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road.

Roadless Area--that area which is roadless, as defined above, and is bounded by a road, the edge of a right-of-way, other landownership, or a significant imprint of man.

Solitude--outstanding opportunities for solitude or primitive and unconfined recreation are wilderness characteristics examined in the intensive wilderness inventory. Factors contributing to opportunities for solitude are vegetative screening, topographic relief, vistas and physiographic variety.

Supplemental Values--features of ecological, geological, or other scientific, educational, scenic, or historical value that may be present in an inventory unit. These are not necessary criteria for wilderness suitability, as is stated in the Wilderness Act of 1964, but must be assessed during the intensive wilderness inventory.

Unnecessary or Undue Degradation--surface disturbance greater than what would normally result when an activity is being accomplished by a prudent operator in usual, customary, and proficient operations of similar character and taking into consideration the effects of operations on other resources and land uses, including those resources and uses outside the area of operations. Failure to initiate and complete reasonable mitigation measures, including reclamation of disturbed areas, or creation of a nuisance may constitute unnecessary or undue degradation. Failure to comply with applicable environmental protection statutes and regulations thereunder will constitute unnecessary or undue degradation.

Way--a two-wheel track created only by the passage of vehicles. A "way" is not a road.

Wilderness--the definition contained in Section 2(c) of the Wilderness Act of 1964 is as follows: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. Wilderness is an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features or scientific, educational, scenic, or historical value.

Wilderness Area--an area formally designated by Congress as part of the National Wilderness Preservation System.

Wilderness Characteristics--Those characteristics of wilderness as described in Section 2(c) of the Wilderness Act. These include size, naturalness, solitude, primitive and unconfined type of recreation, and supplemental values.

Wilderness Inventory--an evaluation of the public lands in the form of a written description and a map showing those lands that meet the wilderness criteria as established under Section 603(a) of FLPMA and Section 2(c) of the Wilderness Act. The lands meeting the criteria will be referred to as Wilderness Study Areas (WSA's). Those lands identified as not meeting wilderness criteria will be released from further wilderness consideration.

Wilderness Review--The term used to cover the entire wilderness inventory, study and reporting phases of the wilderness program of the BLM.

Wilderness Study--the process of analyzing and planning wilderness preservation opportunities along with other resource opportunities within the BLM's planning system.

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PREPARERS

BLM, New Mexico State Office

Project Manager: Leslie M. Cone
Technical Reviewer: Hugh G. Ball

Woodward-Clyde Consultants

Project Manager: Janice R. Hutton
Task Leader: Marilyn Duffey-Armstrong

CONSULTATION AND COORDINATION

Department of the Interior

Bureau of Land Management, State District Office, Albuquerque, New Mexico

Public Service Company of New Mexico

Environmental Affairs, Albuquerque, New Mexico